1-42a

Sent to Caspary by Dr Hasse

Large Tab I—XXII

Small tab 1—78

6

Nelumbiaceae

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Nelumbium Caspary

Bot Jahrb. Vol 16. p. 54 note

1858

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MISSOURI BOTANICAL GARDEN

TO THE

ASSISTANT IN CHARGE,

COAST SURVEY OFFICE,

Washington, D. C.

Aug 6 1864

2 the flower of Helianthium Dfl 22 to 27 perigonial leaves, the lowest ones in reduced pairs, the 9th is nearly above the 1st — the others apparently in 8/13 arrangement.

Petals sometimes slightly or partly convolute,

Transition from petal to stamen rather rare

lowest number of carpels &c. this year was once 9: (7 ext. & 2 inter) once 11 (8&3) and once 12 (8&4)

9 – 11 carpels (7:2 . 8:2 × 9:2) are the lowest numbers observed by me

17/ 1072 0 / 63.1 1072 5 / 63.3
102 102
52 56
51 51
10 55

47/ 1194 0 / 70.2 1253 5 / 73.8 1345 9 / 79.2 15
119 119 134 155
40 64 153 59
51 2 55
135 85
136 78

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Aug 6 1864

The leaf of Nelumbium is not quite circular, but usually a little broader ~~than~~ towards, and a little narrower at the lower half; the upper half is also usually a little longer than the lower one

The point of the leaf, indeed principally by the straight, stouter, almost undivided (while the other ribs are bifurcated) midrib is bracted towards the pedicule, and a little elevated above the lower edge,

I find the ribs as often 23 or 24 in number, more rarely 25 — and very rarely 22.

(Where there are 23 or 25 ribs, there are of course equal numbers of lateral ones, 11 or 12 on each side, and the two lowest ones (opposite the end rib) are close together

Where the whole number of ribs is even (22 or 24) there are 10 or 11 ribs on each side and the lowest rib is unusually a little stouter than the next ones and often ~~forks~~ much ~~bows~~ nearer its insertion than the others, showing that it is composed of two united ones.

Dato alla gentilezza del Sig.re Sig.r De Lozzi

Sig.r Dr. G. Engelmann a St. Louis del Missouri

del Barone Vincenzo Cesati di Vercelli

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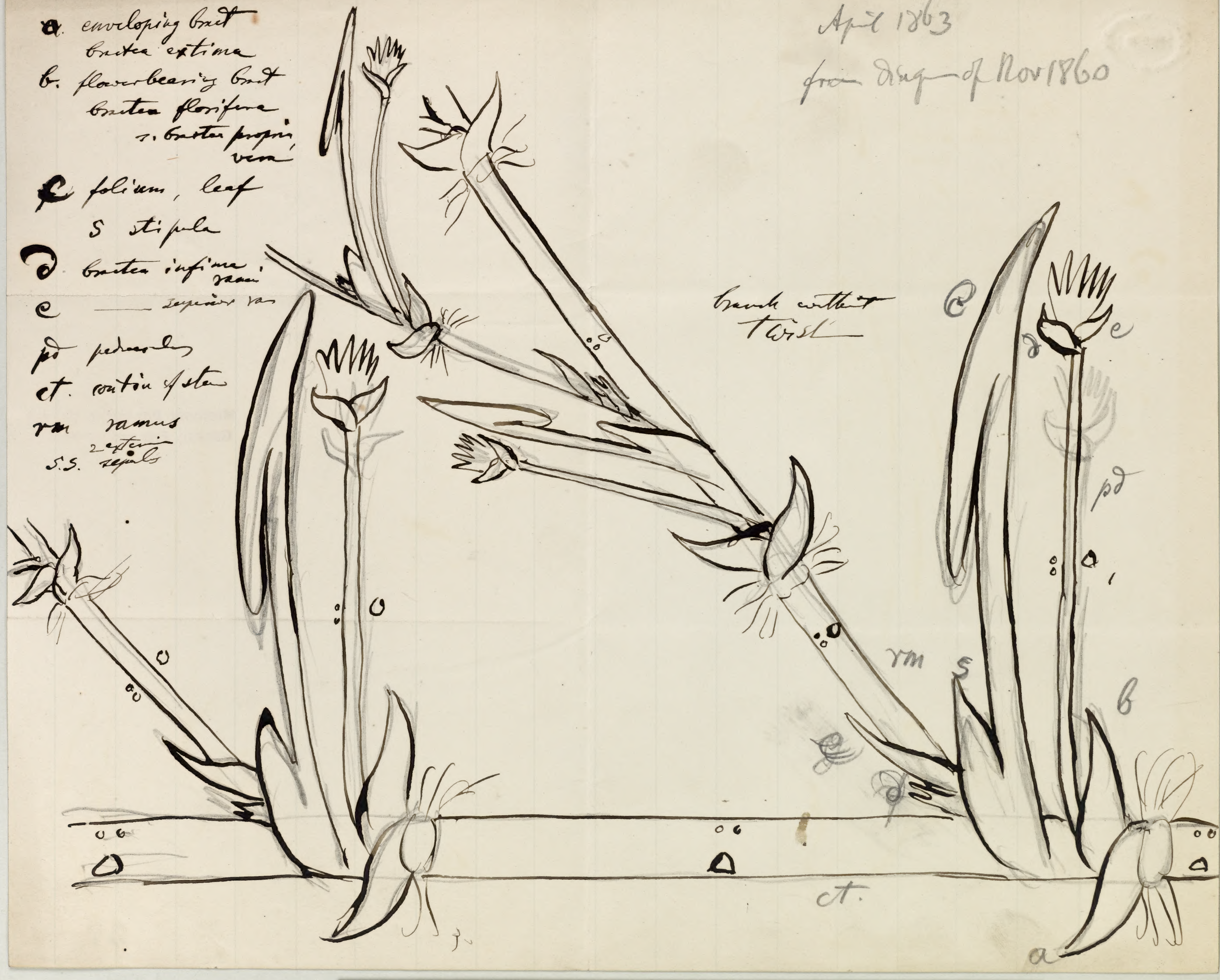
a. enveloping Bract
Bractea extima
b. flowerbearing Bract
Bractea florifera
v. Bractea propria
vena
f. folium, leaf
S stipula
Bractea infima
ramus
c —— superior ramus
pd pedunculus
ct. costa Axis
ram ramus
S.S. 2 exterior sepals

April 1863
from drawing of Nov 1860

branch without
Fruit



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Coast
Nov 1860
Correct ?

Or is the explanation
of Oct 1860 correct?
as the flow not terminal
but axillary ÷
2d bract.

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ЛЕНИНГРАДСКАЯ ГОСУДАРСТВЕННАЯ ОРДЕНА ЛЕНИНА ТЕАТРАЛЬНАЯ БИБЛИОТЕКА

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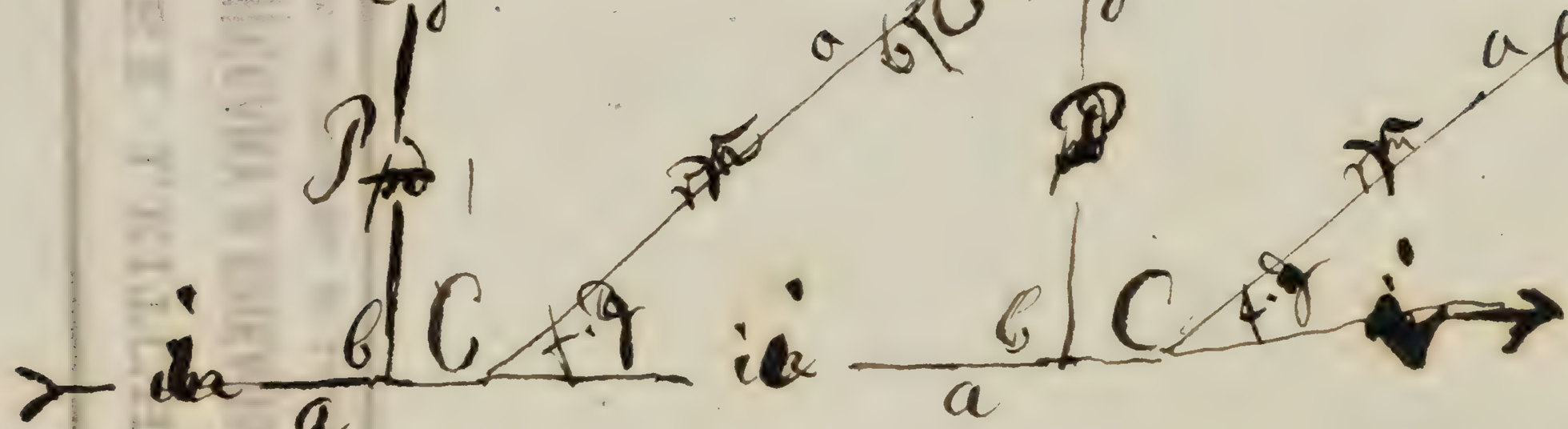

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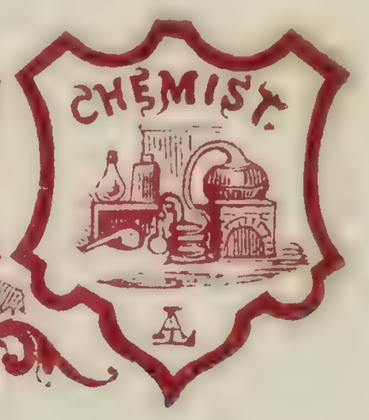

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Buds

The buds especially those which ~~form~~ persist through
winter, (hold) contain the whole plant and all its organs (with the
exception of the parts of the flower) (that) in germ, completely and
~~repeatedly~~ preformed and repeated several times. A bud
2 inches long, contained the primary organs a, b & c portions
~~repeated~~, and the bark or twice repeated, the ~~whole~~ bud
~~with 20 C. but two rotated~~ repeated, thus

1. 2 1
1 . 2 . 3 . 4

In 1. the cup C was 20 lines long ÷ 2, 3 lines ÷ 1 $\frac{2}{3}$ li
and ÷ ~~4 ft~~ 6 li long. All the 7 cycles shown
the flower bud and the branch at their proper places.
~~the formerly~~

I shall not attempt to harmonize the very unusual
disposal of the Organs with the ordinary laws of phyllotaxis,
~~but I will say~~ an explanation however seems to
offer, which may be considered at least plausible:
The flower ~~is that~~ may be considered as the terminal
vascular stem, with 5 alternate distichous polymerous leaf organs:
in the following order: C. a. b. d. e. The lowest leaf
C. bears the bud, the next, a, ~~the next of the stem~~
rising on the ~~same~~ opposite side of the stem, &
this stem is terminated by a flower, which consists of the
axis of the bud which is the continuation of the stem,
the first, ~~or~~ the double bracts f & g, and the second the leaf C.
~~and~~ opposite to the supporting leaf C. d. e. # The bract f
on the axil of C would be opposite to a. i. at having a leaf C

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MISSOURI BOTANICAL GARDEN GEORGE ENGELMANN

This stem is terminated by a bud, which consists of two bud-scales, a and b (Niederblaetter), with very short, confluent nodes, and ~~a large~~ one large ~~b~~ (in opposite directions) stipulate leaf C in the direction of the second scale, succeded by an elongated internode, i, which at its end bears a similar bud. The roots consist of numerous ~~simple~~ thick fibres beset ~~with~~ ing simple fibrillae and originating from the node just behind the lowest scale.

Soon the plant prepares for propagation, ~~and~~ also ~~the~~ in the simplest ~~and~~ ~~also~~ most constant manner; one flower is produced ~~by the second~~ from the axil of the second scale, and one branch from that of the leaf. These parts are always preformed and distinctly visible, ~~when~~ were not fully developed. The flower F is raised on a long stalk, P, without any foliaceous organs at base, but bearing on its top the two lowest organs of the flower, K, which may be termed bracts, the lower one, c, ~~opposite to the second~~ to the in the direction opposite the supporting scale, the upper one, e in the same direction. The branch, r, has at the base of the long internode and opposite to the (leaf supporting) two bud-scales, f and f', one above the other; the internode is terminated by a bud exactly like the one described before, ~~so~~. however that the scale a has ~~opposite to the bract~~ ~~scales f and g~~ a direction opposite to that of the scales f and g and consequently b with P and C with r the same direction.

The following diagram will explain the arrangement of the different organs

Cal all, ~~but Hunter~~ thus merely the regularity of the arrangement of the ~~tops~~,

Thus all the leaf-organs would be destroying, but the bark, etc.

Another and the principal object is the contents of the structures in which I have above considered the stem cells in the pedicles is in reserve, just as it is in the true bark

The tubers of the plant as well as the ~~tuberous~~ Seeds are edible and highly nutritious; ~~the~~ both being replete with amylum but have only been made use of by the Indians. The Chariton river and Chariton settlements on the Missouri are said to derive their name from the Indian name of the ~~Wild~~ Pelecan. ~~The~~ roots ~~of~~ some of the largest tubers obtained at the end of September, I had roasted. They were not done as soon as potatoes, and retains much more firmness; their inside they had a reddish appearance - they were much more palatable ~~than~~ baked than boiled, and had a nearly sweet taste, very pleasant considerably resembling sweet potatoes, without any ~~distinct~~ in any manner resembling any of their organs for steeped water. In decomposition the tubers become gray and at last black, the inside acquiring a beautiful purple color, but a very feetid odor, much resembling that of rotten potatoes. The purple color is produced by deep purple globules, forming in the cells, considerably larger than the blank granules, one only in each cell - undoubtedly an industrious fungoid production. boiled

The seeds are last baked and resemble closely in taste chestnuts.

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Our plant having no perennial rootstock, like its relatives, the Nymphaeaceae, the tubers are the only parts which live through winter, much like those of the potatoe.

Leaves.— All the foliaceous organs are either distichously alternate or they are superimposed in the order detailed above. The lowest scale a, about 3 inches long, ~~is situated on the lower side of the stem.~~ x envelops the whole bud, which, growing, partly bursts through its back w ~~leaves~~ forms a network of meshes filled with

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March 6th 67.

Dear Doctor.

I will not be able to ride out with you today. My bill for house rent 300$ was presented yesterday, have to go a Scratching for money here & there. One man called yesterday Evng. to pay me 40$. whilst I was out in search of him. I must be up and after him this morng.

Respectfy & Truly Yours
Geo. Engelmann

Dr
Geo. Engelmann

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Brandt on Helianthium

Transactions of Illinois State Agricultural Society. vol. IV. 1861 p. 593

He proposes Prével's explanation of the growth of the Helianthium its stipules and stipulary stipules artificially teleological

Grant & the Army rate

Best authors

writer truly

Ebe. stx tutors

explanation of stems.

anatomically non

existent. I

may be supposed

by flattened

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Nelumbium

October 1860

The stem of Nelumbium grows horizontal with a bud at the end,

The bud is enveloped & defended other parts all the organs of the plant & several times repeated, viz several other terminal and axillary buds with their organs.

The internodes (which belong to the leaf) of the stem and branches are elongated, more or less cylindrical (or depressed) during the earlier part of the season, when they produce leaves and flowers.

Towards the fall the internodes become short and thick, and are filled with starch, and in this condition they seem to live through the winter, while all the older parts of the plant die off.

The plant is thus perennial through its tuberous stolons, like the potatoe

All the appendages of the stem, i.e. either the buds and leaves are superposed or ~~opposite~~ alternately

So also the two external sepals are opposite, but the other floral organs are arranged in a very compound order.

The stems and petioles are penetrated by air tubes after a certain regular arrangement.

The completely developed floriferous stem has 3 lateral and one lower tube of more or less equal size, two much smaller upper ones, and one small central one.

The amylaceous stems or tubers show the same arrangement but the tubes are usually

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compressed and variously twisted, and one or both of the upper smaller tubes are sometimes suppressed.

In the branch, the stoutest ones even, the number of tubes is regularly 6 ; the two Cat. end ones being the ~~largest~~ and the lowest by far the smallest, usually very small.

But the branch if an impeded by stiff soil or other impediments, is twisted, so that in the further end the two small tubes are found the upper side.

Where the turning (or twisting) of the branch is impeded by some cause or other, the smaller tubes are of course on the under side.

This seems to continue in the succeeding internodes, whether Cylindrical or tuberous, so that are found tubes with the 7 larger tubes above and the 2 smaller ones below.

In these tubers the buds, leaves etc have to turn up from the lower surface, to obtain their proper position and development.

The peduncle has its tubular arrangement similar to the stem, 6 somewhat equal lateral tubes, the seventh, on the back, is rarely as large as the others, mostly very small, and 1 or 2 small ones are on the upper or ventral side (towards the leaf.) and 1 small one in the centre. There are other small ones outside and between the larger ones; often quite regularly.

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the organs be and C would thus necessarily be turned
downward into the ground, which to avoid, the C & P. strive to
get upwards impart to force the bud instead of the bud a twist they
as it were, running its front part
to the object is also thus rightly themselves. When contrary,
such as hardness of soil &c. by dry seasons, prevent this
twisting, these organs force themselves from below the branch
upwards to the light

Stem The stem or with the long internode of the plumule has
Note His traversed by 6 – 9 air channels or tubes, ~~[illegible]~~
arranged in a circle, hardly running rather perpendicular
and a central one. The short internodes are almost solid,
but beyond the in the next long, internode these thus
are contained even with their peculiarities or abnormity.
adds sevens, obtuse pl. ax. long stalked productus
while in the branches both in the pedicels and rather in the
bark purpose their arrangt of the tube is is reversed.
In the plumule the stem bears at least two but has usually
7 tubes, a pair,

46

The characteristic arrangt exists in
the stem of the plumule has 7 or rarely 8
for these tubes are so distributed that in the stem
then is usually a pair of smaller ones upwards, larger
ones on the sides and a single undersized one below.
In the stem of the plumule 7 (or rarely 8)
tubes, the pair (rarely single (reflexed)) on the side of the lowest leaf and the shorter
and an odd one on the side of the second leaf. The (creeping) stem
of smallest size has 6 tubes, so arranged that its smallest
smallest pair are on the upper side, the largest pair on the
sides and the medium pair on the lower side, in larger
stems these 6 tubes become of equal size, and a sixth
odd one appears at the lower side, usually triangular
in its cross section. An Eight very small tube is added in still
larger stem. and is fully developed plant bearing ones
another Eight small one, the ninth is added to the last, so that
there 3 (total) larger pairs, a small upper pair and
an odd lowest tube appear on the cross section.

15 — 298 / 200 189 110 / 0.0075 270 / 300 270 300 / 0.011 0.020 0.025 / 270 / 6 270 0,022

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54 540

Leaves

The flowers organs ~~have been started~~ enwrapped in the ~~scarcely~~ bud. The leaves of the bud are ~~folded~~ conduplicate, about 3 inches long, and the bud turned in ~~placed on the lower side of the stem~~ so as to envelope the whole bud, ~~the~~ the organs enveloping the whole bud, ~~and the~~ the ~~leaves~~ ~~are~~ ~~compact of its back being~~ ~~quite the~~ ~~they are~~ ~~are either~~ alternately alternate, or are superimposed in the order mentioned above. The lower first or scale, about 3 inches long, ~~completely~~ envelopes the whole bud, ~~with its back~~ placed on the lower side of the stem, and envelopes the whole bud, which destroying ~~the~~ ~~its back~~; ~~and~~ the upper part curves and the ~~base~~ takes its position between the stipule and the leaf, or it finally ~~is~~ ~~folded~~ in two halves, which take a lateral position.

penetrates with the substance of the stem enveloped by the stipule, while the leaf is flattened enveloped in the second scale, b, open on the upper opening side, thus leaving a between the leaf and the stipule, when entire upper part seems entire, ~~the~~ ~~it~~ at last separates in two halves, which take lateral position.

2–5 or sometimes 6–8 inches by

The second scale, b, ~~is~~ by the upper is in its halves ~~in its axil~~ the flower bud, and envelops ~~that~~ the leaf with its stipule; it seems ~~to~~ back of the peduncle.

* The leaf pubescent, ~~purpose~~ C in the same direction as b, but less often divided. ~~It~~ I will only allude to the tubes of its stalk ~~petiole~~, arranged ~~equally~~ like those of the ~~smallest~~ ~~stem~~ Bamboo, the smallest pair, ~~those~~, corresponding to the posterior (interior) grooved part of the stem. The cells of the epidermis of the upper ~~face~~ glass are very small, with a protuberance in the center, which ~~partly~~ produces the velvety (surface water-repelling). The lower ~~parenchyma~~ ~~face~~ ~~shows~~ larger ~~cells~~ consist of larger with corky walls. Finally cells. Stomata are seen ~~upon~~ only with upper surface. A kind of cellular framework, forming large air cavities separates the lower epidermis from the parenchyma of the leaf.

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4

(not always so regular)

In the pedicels the same sort of tubes is reproduced, but so that the pair of small tubes appears on the anterior side, or the side ~~of the basal bud~~ opposite to its supporting scale. In the bud ~~scales~~ 2 pairs of tubes. The smaller pair as in the pedicels on the lower side, opposite to its supporting leaf. The twisted hairs spoken of above, very soon bury the smaller tubes upon as in the stem, ~~of the frond~~ and the original armature can only be seen near the base of the first internode. As the bud grows, new tubes are added, as in the pedicel stem, from which it does not differ in any part. Shooting up a flowering stem a scale or bract at every third node or runner with first a pair of tubes, so that at last a whole bud may be covered with a network of these branched stems. Then the stem grows until the flowering period is passed, the tubes prepare for winter and fall away. by depositing in the shorter and thicker glands a mass of amylon, to feed the terminal bud at its tips and the axillary bud at its base. of the tubes.

The largest of these tubes are ~~ten~~ 5 - 10 inches by 1 - 2 inches in diameter, pointed at both ends, often forked and angled, traversed by the same number of tubes as in the stem, the tubes being usually more single and variously compressed, for the most part filling the cells; their weight ~~of the tubes~~ is from 1½ or 2 to 8 ounces. While all the other parts of the plant perish these tubes remain at the bottom of the lake, enveloped by sediments, and preserved through the winter season, like the potatoe not being properly perennial, with a persistent rootstock like is related to Nymphaeaceae,

At the base of the leaf a stipule ~~of~~ of texture similar
to the sheaths, ~~about~~ 2-2½ inches long ~~in~~ fully developed, ~~Specimens~~
~~has~~ envelopes the bud as well as the contents of the
stem, while the latter, growing out, leaves it at its
upper side, the branch penetrates its back and usually at
last splits it in two. Thus placing it between the
branch and the stem ~~long internode~~, resting on the latter
The flowering ~~stem~~ (P.) is as I have stated before found in the
axil of the scale. Bud is ~~also~~ ~~also~~ present
~~it is proved in the fall in the axil but but destroyed~~
~~with the axis~~ always present, though ~~if~~ not
developed ~~even~~ the bud which is found in the fall to live
in winter in cavity at the back of the base of the petiole, which is also scale. Scales
though water, already rotting at ~~the~~ It has not long
at the lower end, but at the upper end, under the flower
~~and usually considered~~ properly ~~Calyx~~ which are the bracts in the
~~same~~ axil which might be claimed as bract ~~in the~~
~~axil~~ the lowest one opposite to the dried ~~off~~
the supporting scale, the upper one in the same axil.
These bracts are already found in the smallest bud of ⅛ line
diam, they are similar to the next following scales, but are
persistent while the others fall off. The following scales
are angled in more complicated ~~by~~ by Cotaledonous ~~ones~~.
but see pg 2 of this!

The first

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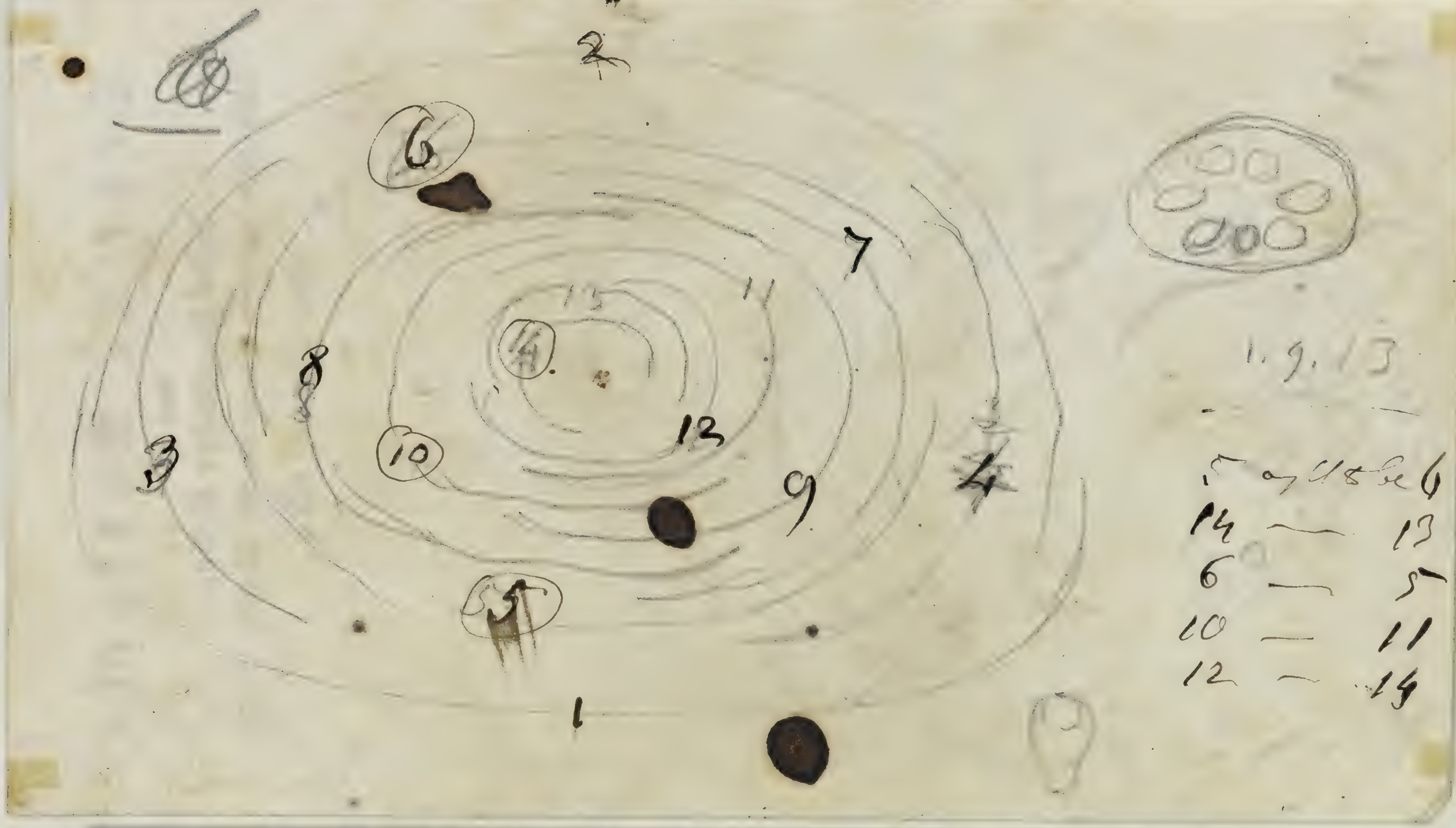

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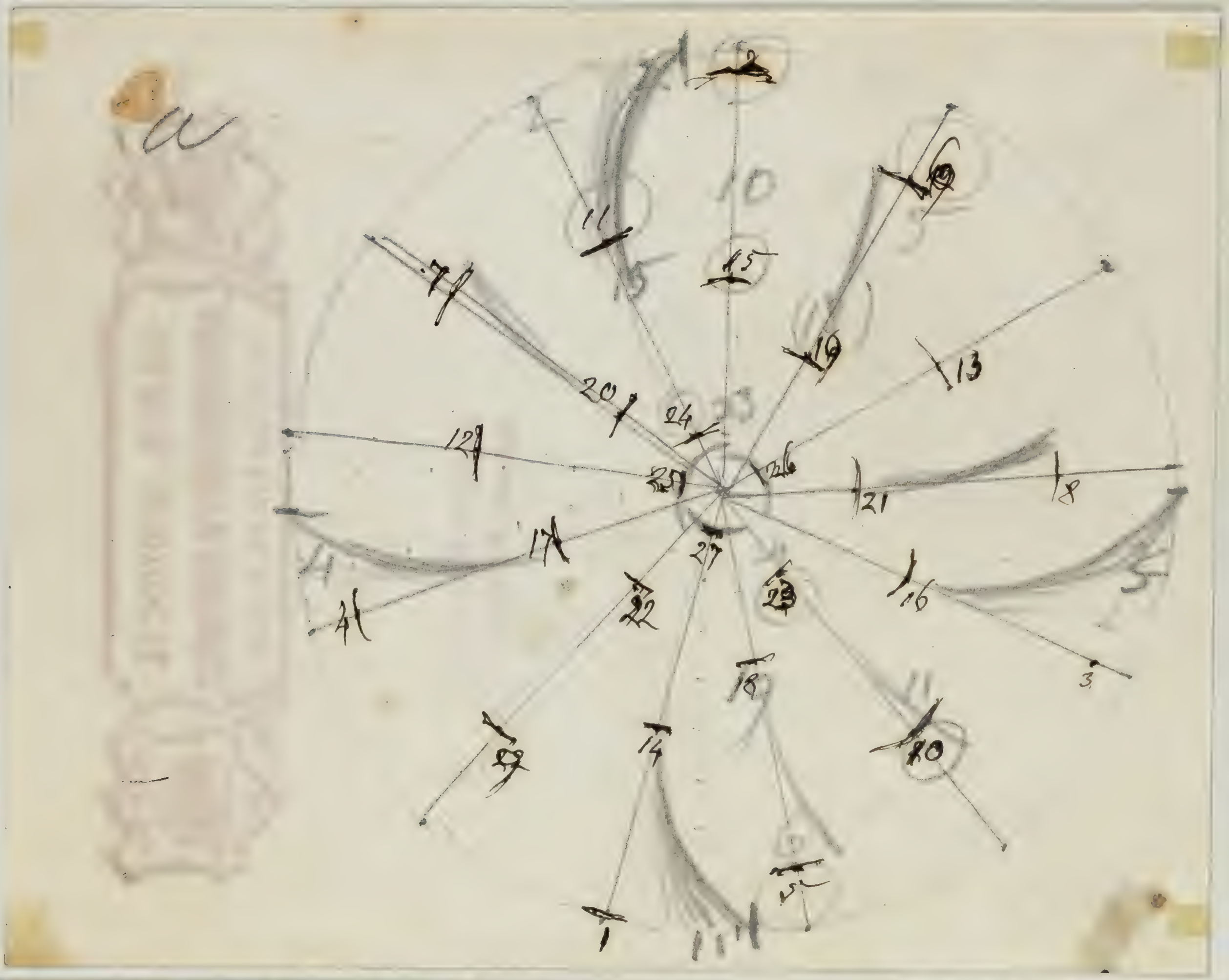

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APOTHECARY & CHEMIST,

Cor. 4th and Olive Sts., St. Louis.

CHEMIST

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GEORGE ENGELMANN FUND

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Aug. 16 1864

1. 2 pairs 4
2. 2/5 5
3. 3/8 8
4. 2/13 13

13
30
17

Cut worms

25 - 27

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APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.

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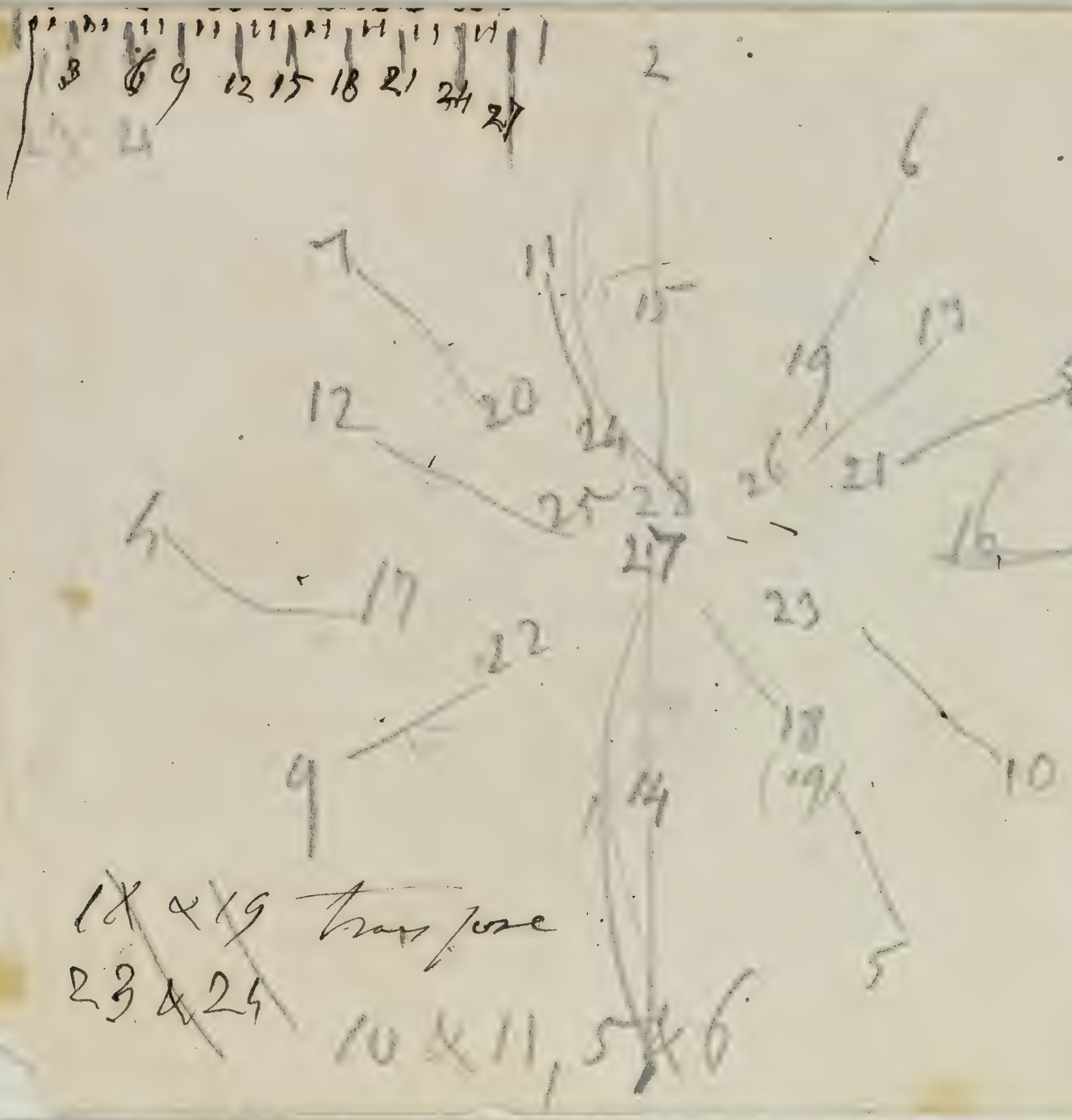

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Arrangement of Capsules — Pebbled flower Fig 41

$\frac{3}{60}$ 0.133 in or abt $\frac{1}{8}$ in

$\frac{1}{8} = 0.125$

Small circle marking each $\frac{14}{60}$ by $\frac{9}{60}$ by $\frac{1}{4}$ in by $\frac{1}{4}$ high

pebbled flower $\frac{30}{60}$ $\frac{1}{2}$ in by — Rim of capsule about $\frac{18}{60} = \frac{1}{3}$ or abt $\frac{2}{10}$ receptacle

each capsule $\frac{15}{270}$ = each anther $\frac{8}{270}$ =

Bud entire very plant repeatedly.

Ovule Anatropous — Dorsal gibbosity. Ovary 1 loc

University of ~~Oxford~~ Dissected to Epiphysis.

micrograph of anatropous ovule to Centre

back of first coat to pipl.

— — second — — Centre.

Ovaries 12-25 (Grey) 9-31 (Byles) (Wittrock)

in 2 rows

The bud of H. fell contains I system. II. III & IV in each

with a full complement of flowers > ~~with it~~

the bud of I, 1. 2. that of II. 1 — fully

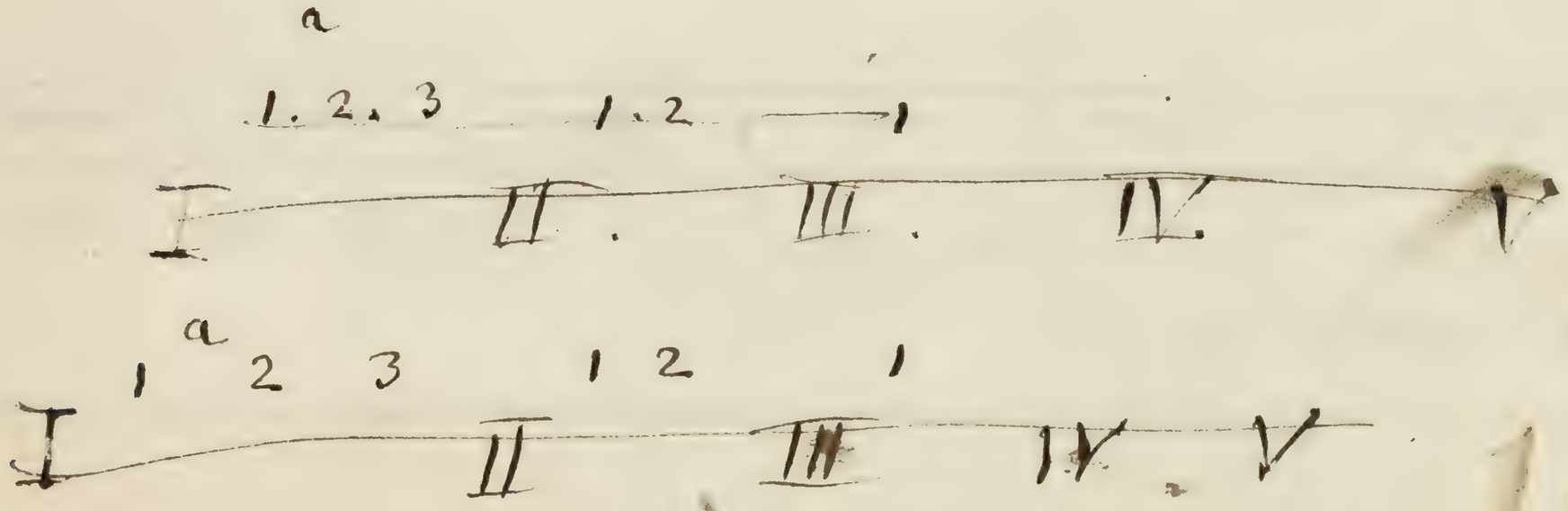
developed the first green in volute leaf in all these

very young ~~2 to 4~~; it is probable that

also V; I 3; II. 2; III. 1 & I. 1. a;

4 more in all 12 nodes can be found.

(with 11 leaves or flowers buds etc)



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January.	March.	April.	May	June.	July.	August.	September.	Octo
				1	4	18	120.	
				9	9	9	9	

the ——— at St Louis. Ills. Lat. 38°37' Long. 90
ervation 95 feet above the mean level of the Mississippi and 481 feet above the Gulf

IV.—*The difficulties incident to the laying of long Electric Sea Cables.*

Few people can imagine the great mechanical difficulties to be overcome in laying a long cable. Owing to the difficulty of making the joinings properly at sea, the rope cannot be carried out in more than two portions, and there are very few ships capable of conveying the required load in the necessary manner. An electric cable is a difficult thing to coil, indeed no one who inspects it in short lengths would believe it capable of being coiled at all; the cable must, therefore, be laid in the hold, in as large a circle as possible, and the space occupied must be perfectly clear from cross beams, or perpendicular supports for the deck. The cable must be placed so as to load the vessel evenly, and must be so paid out that she shall preserve an even keel, otherwise water ballast must be admitted to keep the vessel in trim. Moreover, with a long cable, the vessel employed should be a steamer of sufficient dimensions not only to contain it, but coals as well for the entire voyage, for if stowed in a sailing vessel and towed by a steamer, the ship becomes in a heavy sea unmanageable, and in case of a hitch occurring, it is almost impossible to check her progress in time to prevent accident. A cable long enough to span the Atlantic will weigh at least 6,000 tons; and when coals must be carried, and in addition a clear space provided sufficient to enable this enormous length of cable to be coiled, it is evident that no existing vessel, except the Great Eastern, would be equal to the requirements of the case. The hands employed in liberating the cable coiled in the hold have a difficult task to perform, even when the sea is calm and everything goes on smoothly. When at full speed, the coils have to be carefully liberated, layer by layer, from the lashings and packings of wood, so as to set free only as much of the cable as is required, so as to avoid the possibility of its escaping from the guides on receiving any check. The break is a part of the apparatus which requires the most delicate handling; the strain which it puts on must be sufficient to prevent the cable from running out with too great a velocity in proportion to the speed of the vessel, whilst it must be sensitive to every pitch and roll, in order to prevent the cable from being snapped by a sudden strain. Many self-acting brakes have been proposed, but in practice nothing has been found so effectual for the regulation of the strain as constant personal superintendence. The speed at which the paying-out vessel travels should be as uniform as possible throughout the whole voyage, and as provision must be made for contrary winds and rough weather, a large amount of surplus power is indispensable. In fair weather it is not difficult to attend to all these precautions, nothing but proper care and attention being necessary; but in stormy weather, when the vessel is tossing to such an extent that the men can scarcely stand while unlashing and freeing the cable, when the pitching of the ship throws sudden and violent strains upon the break, and when the breaksman himself can scarcely keep his feet and can see nothing in the darkness, the difficulty of managing the apparatus properly is of no ordinary kind.—*The Quarterly Journal of Science.*

V.—*Submarine Volcano in the Mediterranean.*

Letters from Malta mention an extraordinary convulsion of nature not far from that city, between the island of Pantellaria and the town of Sciacca, on the coast of Sicily, a submarine volcano having broken out about twenty-five miles from the shore. It is said that a volcano existed there in the year 1701, and on an old chart there is an old reef laid down precisely on the spot where the volcano now is. It was first indicated by smoke rising from the sea about the 12th of August last, which gradually increased in volume for several days till fire was seen, and eventually a small island was thrown up above the surface, about eighty or ninety yards long and twenty or thirty high, composed of cinders. In its centre was the crater, which continually emitted steam and smoke

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the action of the sun; but the earth's rotation must not be disregarded, as it is very important, and the moon probably exerts a tidal influence upon the air as well as upon the water of our globe. If no disturbing operations took place, we should only have hot air rising from equatorial regions, and being replaced by colder streams from the less heated poles. The real facts are, however, in the highest degree complicated, as many distinct forces contribute more or less to excite motion at different heights and in different directions, and a host of circumstances, such as the distribution of land and water, mountain ranges, plains, etc., etc., produce modifications over a wider or smaller range.

Of the influence of the moon, he writes:

Upon the difficult question of the action of the moon, Admiral Fitzroy has an interesting chapter, and he does not consider that the probability of an important tidal influence is invalidated by the fact that the barometer does not give proportionate indications. He believes that there is "a continuous overflow of air, like that described by Dove and others, which not only prevents much sensible increase of statical pressure or tension, but augments the dynamical forces of the tropical currents of air, periodically by lunar periods, and diurnally also." This theory is probable, and the Admiral states that "recurring periods of about fourteen days (semi-lunar), of seven, and of three or four days, have been traced, however masked or irregular, more or less synchronous with the moon's phases, *occasionally*, and then for a few times rather correspondent, therefore evidencing some kind of connection." The Admiral also observes that the consecutive actions of the moon in raising and causing an overflow of a mass of air must give rise to periodical impulses bearing a different direction to the normal currents.

"During the moon's passage from quadrature to syzygy her action on air currents should increase, and conversely, when she has great north declination, it ought to be greater here than when she is far south, and when in perigee greater than in apogee. Tabular records show such are the facts." Abstract reasoning tends to the conclusion that the moon must influence our atmosphere, although forces more powerful than that exerted by our satellite may counteract or conceal her work, but, as we shall see, distinguished authorities adopt conflicting views.

Admiral Fitzroy appears to connect the successive impulses to atmospheric movement given by the moon with the daily changes that occur at intervals of about six hours. Lunar actions may have something to do with these, but they seem more directly referable to the operation of solar heat and of radiation. Quetelet says: "If we compare the variations of the barometer with that of the thermometer, we observe that oscillations of pressure as well as of temperature are much stronger in winter than in summer;" but he adds that in autumn there is less difference in the barometer and thermometer than might have been anticipated. He likewise observes that the diurnal variations of the barometer, which take place at intervals of about six hours, exhibit peculiar displacements, so that in winter the interval between the maximum and minimum of pressure diminishes a little, and augments in summer.

Professor Lamont believes that the sun exerts two influences upon the diurnal variation of the barometer, one that of heat, and the other of an "electrical" attractive force; and Professor Plantamour considers that the tidal action of the moon on the air is shown to be insensible, by observations which he carried on through twenty-four lunations. He says: "I have taken the mean barometrical heights, observed at different hours, the day of the syzygy, the day before, and the day after; the day of the quadrature, the day before, and the day after." He then gives the result of one hundred and forty-four days at the syzygy epoch, and of one hundred and forty-four days at the quadrature epoch, which do not correspond with what might be computed from the lunar-tidal theory. He also gives the hours at which the maxima and minima occurred at syzygies and at quadratures, and remarks, "the second terms (minima) are nearly identical in value, and the time only differs a few minutes; while if the atmospheric tide came from molecular attraction, exerted by the moon as well as by the sun, the time of minimum at the quadratures ought to have changed by six hours, and its value should have been reduced about one-third."

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

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Caspary bittet um gütige Zusendung
folgender Früchte in Spir. von Nymphaeen

1). Reife Früchte von Nymphaea advena mit den Samen,
die Früchte, getrocknet u. Samen in Flasche.

2) Gute Blumen von Brasenia peltata, um Samen mit
den morphologischen Verhältnisse der Blüthentheile kennen zu lernen.

3) Blumen u. Früchte von Brasenia peltata, in Spir. conf.
u. in Flasche getrocknet.

4) Abbildung über die Stellung der Blumen bei
der Brasenia.

5) Kommen Rhizomknollen in der Gestalt der Früchte bei Nymph.
odorata vor, ähnlich, wie bei Nym. alba?

6) Ist es nicht möglich gute Exemplare von Nuphar sagittae-
folia Walt. und Caroliniana zu bekommen. Die Blüthen
der Frucht, die Samen sind ganz unbekannt. Und Lindl.
& Hook sind Exemplare bekannt.

7) Nuphar advena Aiton Torrey & Gray, in Rich.
Delphia vorkommend, ist mir unbekannt!

8) Abbildungen u. ähnliche Knollen von Nymph. odo-
rata, Nuphar advena u. andere Nymphaeaceen wären mir
sehr erwünscht.

9) Es hilft mir gewiss sehr die Lücke der Catalogs
der Akad. Petersburg, für den Namen der Abstammung der ver-
schiedenen Abänderungen der „ovalen" Nymphaea
genügend festen.

10) Fr. bot. Torrey Nuphar sagittaefolia Walt. wünscht.

11) Abbildung von Nymphaea odorata u. Nuphar
advena.

Missouri Botanical Garden
George Engelmann Papers

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